

CLAIMS:

1. A method of operating upon a workpiece having a top surface, a conductive layer and a bevel edge comprising the steps of:

performing workpiece processing on a top surface of the workpiece with the workpiece disposed in a lower chamber of a vertical chamber assembly;
moving the workpiece from the lower chamber to an upper chamber after the step of depositing;

sealing the upper chamber from the lower chamber with a moveable guard to prevent liquid fluid communication between the upper chamber and the lower chamber and provide a sealed upper chamber; and

removing the bevel edge of the workpiece with the workpiece disposed in the sealed upper chamber of the vertical chamber assembly.

2. The method according to claim 1 wherein the step of removing includes the steps of:

rotating the workpiece; and

directing a stream of an etching solution to the bevel edge of the workpiece and a front edge surface of the conductive layer from a nozzle located within the sealed upper chamber while rotating the workpiece, thereby outwardly directing the stream of the etching solution from the front edge surface to the bevel edge of the workpiece and causing removal of the conductive material from the bevel edge and the front edge surface of the conductive layer.

3. The method according to claim 2, further including the step of spraying a cleaning solution onto the top surface of the workpiece with the workpiece disposed in the sealed upper chamber of the vertical chamber assembly.

4. The method according to claim 3 wherein the step of spraying takes place prior to the step of removing.

5. The method according to claim 4 further including the step of drying by rotating the workpiece after the step of spraying and prior to the step of removing.

6. The method according to claim 2 wherein the step of performing
5 workpiece processing comprises depositing a conductor on the top surface of the conductive layer of the workpiece.

7. The method according to claim 6 wherein the step of performing
workpiece processing performs electrochemical mechanical processing.

8. The method according to claim 7 wherein the step of performing
electrochemical mechanical processing performs an electrochemical mechanical
deposition process.

9. The method according to claim 8 wherein the step of performing the
electrochemical mechanical deposition process uses a plating solution.

10. The method according to claim 9, further including the step of spraying a
cleaning solution onto the top surface of the conductive layer with the workpiece
20 disposed in the sealed upper chamber of the vertical chamber assembly.

11. The method according to claim 10 wherein the step of spraying takes place
prior to the step of removing.

12. The method according to claim 11 further including drying by rotating the
workpiece after the step of spraying and prior to the step of removing.

13. The method according to claim 1 wherein the step of performing
workpiece processing depositing a conductor on the top surface of the conductive layer of
30 the workpiece.

14. The method according to claim 1 wherein the step of performing workpiece processing performs electrochemical mechanical processing.

15. The method according to claim 14 wherein the step of performing electrochemical mechanical processing performs an electrochemical mechanical deposition process.

16. The method according to claim 15 wherein the step of performing the electrochemical mechanical deposition process uses a plating solution.

17. The method according to claim 16, further including the step of spraying a cleaning solution onto the top surface of the conductive layer with the workpiece disposed in the sealed upper chamber of the vertical chamber assembly.

18. The method according to claim 17 wherein the step of spraying takes place prior to the step of removing.

19. The method according to claim 18 further including drying by rotating the workpiece after the step of spraying and prior to the step of removing.

20. The method according to claim 1, further including the step of spraying a cleaning solution onto the top surface of the workpiece with the workpiece disposed in the sealed upper chamber of the vertical chamber assembly.

21. The method according to claim 20 wherein the step of spraying takes place prior to the step of removing.

22. The method according to claim 18 further including drying by rotating the workpiece after the step of spraying and prior to the step of removing.

23. An apparatus for operating upon a workpiece having a conductive layer and a bevel edge comprising:

a vertical chamber assembly including an upper chamber and a lower chamber, the upper chamber being separable from the lower chamber by a moveable guard to
5 provide a sealed upper chamber and prevent liquid fluid communication from the sealed upper chamber to the lower chamber;

a moveable and rotatable workpiece holder that holds and rotates the workpiece with the workpiece disposed in either the upper chamber and the lower chamber, and adapted to move the workpiece between the upper chamber and the lower chamber;

10 a workpiece processing system disposed in the lower chamber for operating on a top surface of the workpiece; and

an edge bevel removal system disposed in the upper chamber.

15 24. The apparatus according to claim 23 further including a workpiece cleaning system disposed in the upper chamber.

25 25. The apparatus according to claim 24 wherein the edge bevel removal system includes at least one edge conductor material removal device for supplying a stream of an etching solution toward at least the front conductive surface edge of the workpiece.

26. The apparatus according to claim 25 wherein the edge copper removal device comprises at least one nozzle disposed within a position relative to the workpiece
25 such that the stream of the etching solution is directed outwardly toward the front conductive surface edge of the workpiece.

27. The apparatus according to claim 26 wherein the workpiece cleaning system includes a cleaning nozzle disposed for directing a cleaning solution to the front
30 surface of the workpiece.

28. The apparatus according to claim 23 wherein the edge bevel removal system includes at least one edge conductor material removal device for supplying a stream of an etching solution toward at least the front conductive surface edge of the workpiece.

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29. The apparatus according to claim 28 wherein the edge copper removal device comprises at least one nozzle disposed within a position relative to the workpiece such that the stream of the etching solution is directed outwardly toward the front conductive surface edge of the workpiece.

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30. The apparatus according to claim 23 wherein the workpiece processing system is an electrochemical mechanical processing system.

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31. The apparatus according to claim 30 wherein the electrochemical mechanical processing system is an electrochemical mechanical deposition system.